SYSTEM OVERVIEW

Description: 400V DC Output @ up to 30kW Power System

The NetSure™ 4015, 30kW DC Power System is a complete integrated power system containing rectifiers, intelligent control, metering, monitoring, and distribution. The individual system sub-racks can be factory integrated into a standard 19" IT rack or provided separately for customer integration into an existing IT rack.

This power system is capable of operating either with or without batteries online.

This system consists of the following components.

- **Power and Control Sub-Rack (List 11, 12)**

  The system contains one (1) "power and control sub-rack", which houses up to two (2) rectifiers and the system control and monitoring components.

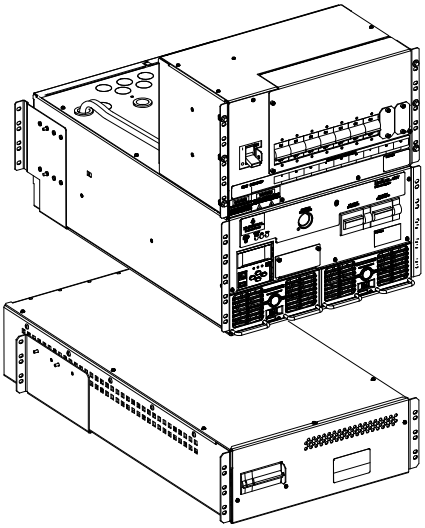
  - **Rectifier(s)**

    The system contains one (1) or two (2) rectifiers, which provide load power, battery float current, and battery recharge current during normal operating conditions. Refer to the rectifier instructions (UM1R40015000e) for more information.

  - **Controls**

    ACU+ (Advanced Control Unit Plus) Controller

    The system controller provides power system control, rectifier control (including a charge control function), metering functions, monitoring functions, and local/remote alarm functions. Power system control includes battery low voltage disconnect (BLVD) functionality to remotely trip battery circuit breakers which protects batteries against over-discharge. The system can also be equipped with one (1) or two (2) temperature probe(s). Any combination of the two (2) temperature probes can be programmed to monitor ambient air temperature and/or battery temperature. A temperature probe set to monitor battery temperature can also be used for the rectifier battery charge temperature compensation feature and/or BTRM (battery thermal runaway management) feature. The controller also provides data acquisition, system alarm management, and advanced battery and energy management. The controller contains an LCD display and keypad for local access. The controller provides Ethernet connection and supports software upgrade via its USB port. It also comes with a comprehensive web page and SNMP capability for remote system management. Refer to the ACU+ controller instructions (UM1M820NNB-1) for more information.

    System Shutdown

    A "System Shutdown" pushbutton is located on the front of the power and control sub-rack. When momentarily depressed, the rectifier's AC input circuit breakers and the Emerson provided battery trays' battery disconnect circuit breakers are tripped open to isolate the system from all electrical sources. Manual intervention is required to restart the system.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

- **Load Distribution Sub-Rack(s) (List 21-24)**

  The system may contain up to two (2) “load distribution sub-racks”, which provide DC distribution through circuit breakers. Optional main row breaker required for UL applications. Distribution can also be bulk with no “distribution sub-rack”.

- **Battery Tray(s) (List 91, 92)**

  The system may contain up to five (5) battery trays, each housing one (1) 400V battery string consisting of twenty-eight (28) 12V battery blocks (336V nominal). Customer supplied external battery strings can be connected to the system. The total number of internal and external battery strings cannot exceed five (5).

- **IT Rack Integration (List R1, R2)**

  Choice of 24U or 42U rack, also includes factory installation, integration, and testing of all selected components.

- **Available Grounding Configurations**

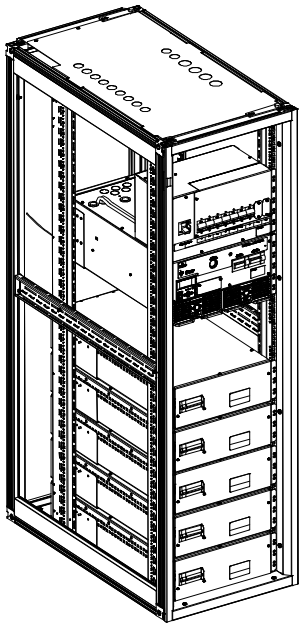
  HRMG (High Resistance Midpoint Ground) Configuration (+/- 200V DC)

  The HRMG configuration provides system voltages to ground at half of the output system voltage, for additional personnel safety. That is, the HRMG version of 400V DC produces +/-200V DC to ground potentials. This configuration is used in applications where an internal high resistance path is required between the positive output busbar and site ground and also the negative output busbar and site ground.

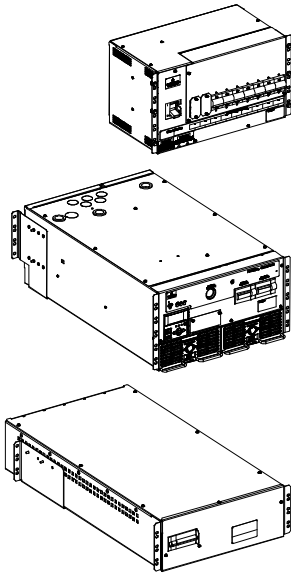
  The DC bus is continuously monitored for ground fault conditions. If the insulation resistance between the +BUS or -BUS to ground goes below a set value, a ground fault alarm is generated. (Refer to UM584000300 [Operation Instructions] for additional information on this topic.)

  NPG (Negative Pole Ground) Configuration (+400V, -0V DC)

  This configuration is used in applications where the negative output busbar is required to be connected to site ground.



Complete Solution
(components factory installed in an Emerson Network Power DCM IT Rack)



Individual Components

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

General Specifications

Family:	NetSure™
System Spec. No.:	584000300
System Model:	4015-X003
System AC Input Voltage	Nominal 380/400/480 volts AC, three phase, 50/60 Hz, with an operating range of 260 to 530 volts. Acceptable input frequency range is 45 to 65 Hz. A single 4-wire (no neutral) AC input feed supplies both rectifiers.
System Output Voltage (max.):	400V DC
Output Capacity:	
System:	89A, 30kW (maximum)
Rectifier:	44.6A @ 336V DC to 37.5A @ 400V DC, 15kW (maximum)
System Agency Approval:	UL Listed per UL60950-1 (cUL for Canada). CE Marking per low voltage directive (EN60950) and the EMC directive. (See "1.5.1 Safety Compliance" on page 27.)
EMI:	EN 300 386, Class A and FCC Part 15, Class A
Framework Type:	Rack Mounting in an IT Rack (EIA-310-D Compliant)
Mounting Width:	19 Inches (483mm), nominal
Mounting Depth:	
Power and Control Sub-Rack:	724mm (28.5 inches)
Load Distribution Sub-Rack:	257mm (10 inches), HRMG Configuration 317mm (12.5 inches), NPG Configuration
Battery Tray:	838mm (33 inches)
24U Rack Dimensions:	1194mmH x 600mmW x 1000mmD (47"H x 24"W x 40"D)
42U Rack Dimensions:	2000mmH x 600mmW x 1000mmD (79"H x 24"W x 40"D)
Access:	Front and rear for installation and maintenance. Front for operation.
Control:	Microprocessor
Color:	Black
Environment:	-5°C to +45°C (+23°F to +113°F). Full Rating: -5°C to +35°C (+23°F to +95°F). Note: Battery manufacturers recommend an operating temperature of 25°C (77°F). Ambient temperatures higher than this reduce battery life; temperatures lower than this reduce battery capacity. For optimal battery performance and service life, battery temperature should be maintained between +20°C to +25°C (+68°F to +77°F).

See detailed specifications on page 26.

Customer Supplied IT Rack Guidelines

If you plan to assemble / configure your own system, note that the NetSure 4000 Series components (power and control sub-rack / load distribution sub-rack / battery tray) were evaluated as a UL Listed system in an Emerson Network Power DCM IT Rack in an ambient of +35°C (95°F), with a front and rear door free area ratio of 83%.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

TABLE OF CONTENTS

SYSTEM OVERVIEW **1**

TABLE OF CONTENTS **4**

MAIN COMPONENTS ILLUSTRATIONS **6**
- **Factory System Integration – Lists R1 and R2 (Assembled System)** **6**
- **Customer System Integration – Installed in Customer IT Rack** **6**
- **Power and Control Sub-Rack - Lists 11 (HRMG) and List 12 (NPG)** **7**
- **Load Distribution Sub-Rack – List 21-24** **8**
- **Battery Tray - List 91 (HRMG) and List 92 (NPG)** **9**

LIST DESCRIPTIONS **10**
- **Power and Control Sub-Rack** **11**
  - List 11: Power and Control Sub-Rack – HRMG (High Resistance Midpoint Grounded) Systems 11
  - List 12: Power and Control Sub-Rack – NPG (Negative Pole Grounded) Systems 11
- **Load Distribution Sub-Rack** **12**
  - List 21: Load Distribution Sub-Rack with Row Breaker – HRMG (High Resistance Midpoint Grounded) Systems 12
  - List 22: Load Distribution Sub-Rack with Row Breaker – NPG (Negative Pole Grounded) Systems 12
  - List 23: Load Distribution Sub-Rack without Row Breaker – HRMG (High Resistance Midpoint Grounded) Systems 13
  - List 24: Load Distribution Sub-Rack without Row Breaker – NPG (Negative Pole Grounded) Systems 13
- **Battery Tray** **14**
  - List 91: Battery Tray – HRMG (High Resistance Midpoint Grounded) Systems 14
  - List 92: Battery Tray – NPG (Negative Pole Grounded) Systems 14
- **Temperature Probes** **15**
  - List 98: Temperature Probe, 12 Feet (4m) Total Cable Length 15
  - List 99: Temperature Probe, 33 Feet (10m) Total Cable Length 15
- **Rack Integration (Factory Integrated System)** **16**
  - List R1: 24U, 19” 16
  - List R2: 42U, 19” 16

ACCESSORY DESCRIPTIONS **17**
- **DC Load Distribution Devices** **17**
  - DIN-Rail Type Load Circuit Breakers 17
  - Load Circuit Breaker Lockout/Tagout Assembly 18
- **User Replaceable Components** **19**

ONE LINE DIAGRAM **20**

RECOMMENDED WIRING SIZES, BRANCH CIRCUIT PROTECTION, AND CRIMP LUGS **21**
- **Equipment Grounding** **21**
  - Factory Furnished IT Rack Frame Grounding 21
  - Sub-Rack Frame Grounding (for systems installed in a customer furnished IT rack) 21
  - Return Busbar (-Bus) Grounding (NPG Configurations Only) 22
- **AC Input (Power and Control Sub-Rack)** **23**
- **DC Load Distribution (Distribution Sub-Rack)** **24**
- **DC Load Distribution (Bulk Output from Power and Control Sub-Rack)** **25**
- **External Controller Interface (Distribution Sub-Rack)** **25**
- **Battery (Power and Control Sub-Rack)** **25**

SPECIFICATIONS **26**
- **1. System** **26**
  - 1.1 System DC Output Ratings 26
  - 1.2 System AC Input Ratings 26
  - 1.3 System Environmental Ratings 26

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

1.4 Physical....26
1.5 System Compliance Information....27
2. Rectifier....27
3. ACU+ Controller....27

MECHANICAL SPECIFICATIONS....28
Rack Integrated System (24U) (List R1)....28
Rack Integrated System (42U) (List R2)....28
Dimensions and Weights....29

RELATED DOCUMENTATION....31

BATTERY MANUFACTURER INFORMATION....31

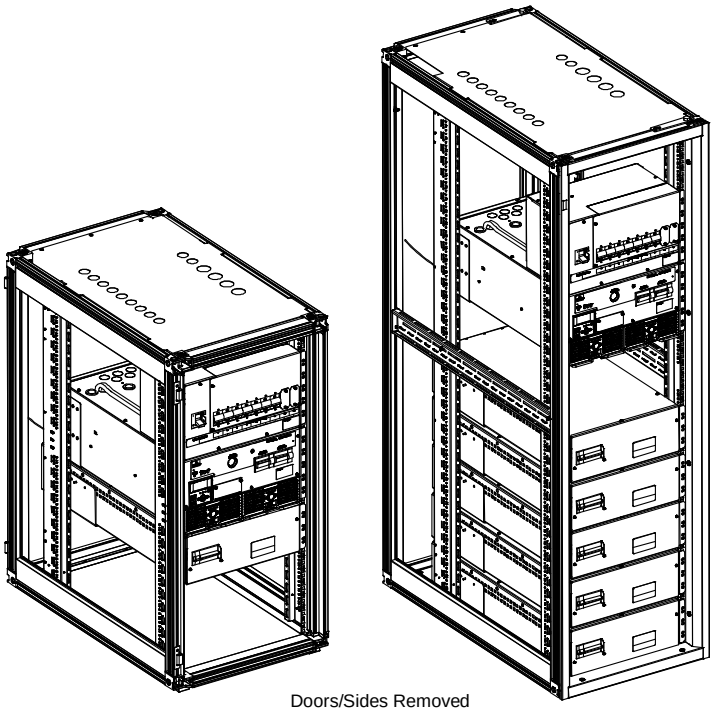
This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

MAIN COMPONENTS ILLUSTRATIONS

Factory System Integration – Lists R1 and R2 (Assembled System)

Note: *Also order individual sub-racks List 11, 12, 21, 22, 23, 24, 91, 92; not to exceed 24U for List R1 and 42U for List R2.*
See List Descriptions on page 10.

List R1:
Complete Solution
(components factory installed in Emerson Network Power DCM 24U IT rack)

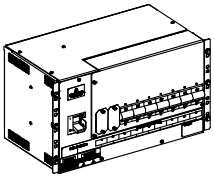


List R2:
Complete Solution
(components factory installed in Emerson Network Power DCM 42U IT rack)

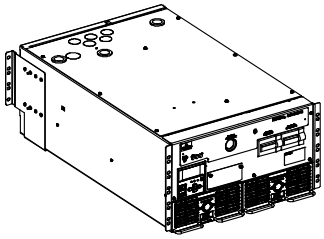
Doors/Sides Removed
in Illustration for Clarity

Customer System Integration – Installed in Customer IT Rack

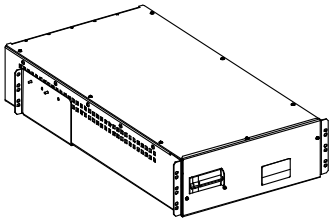
Note: *Order List 11, 12, 21, 22, 23, 24, 91, 92.*
See List Descriptions on page 10.



Load Distribution Sub-Rack(s)
(6U each)
(List 21, 22, 23, 24)



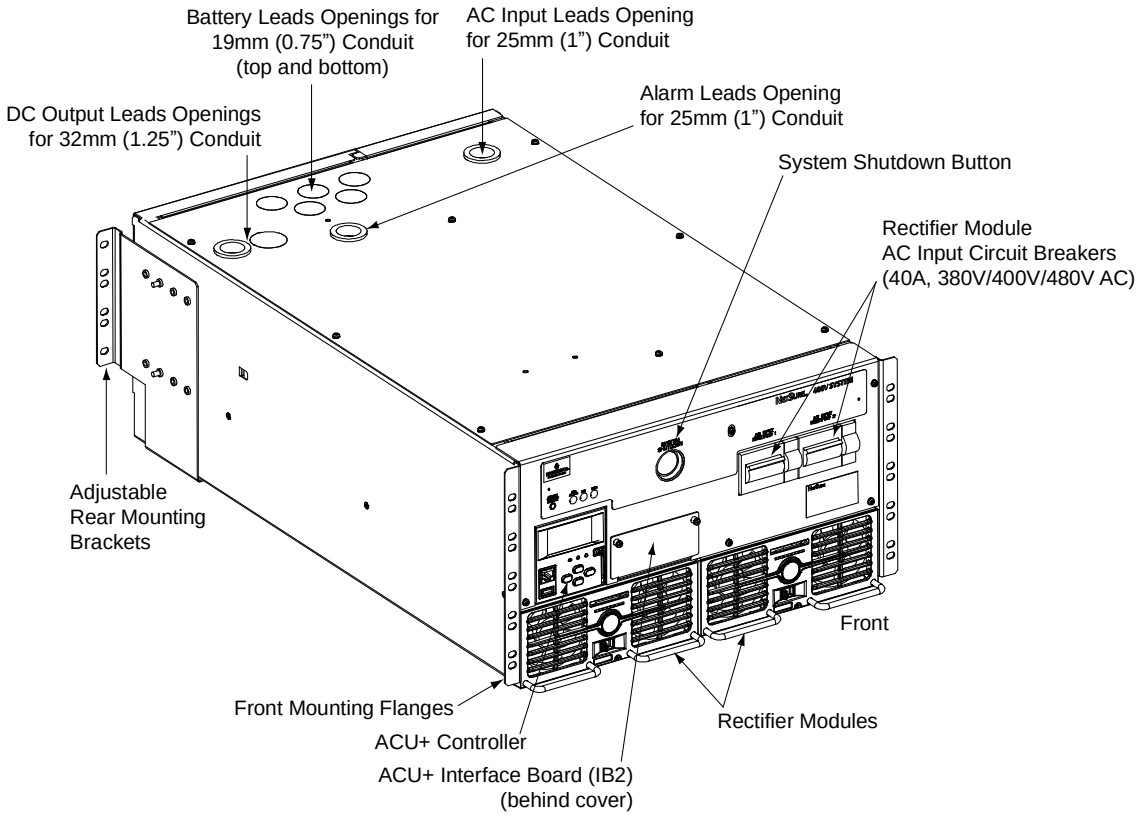
Power and Control Sub-Rack
(6U)
(List 11 and 12)

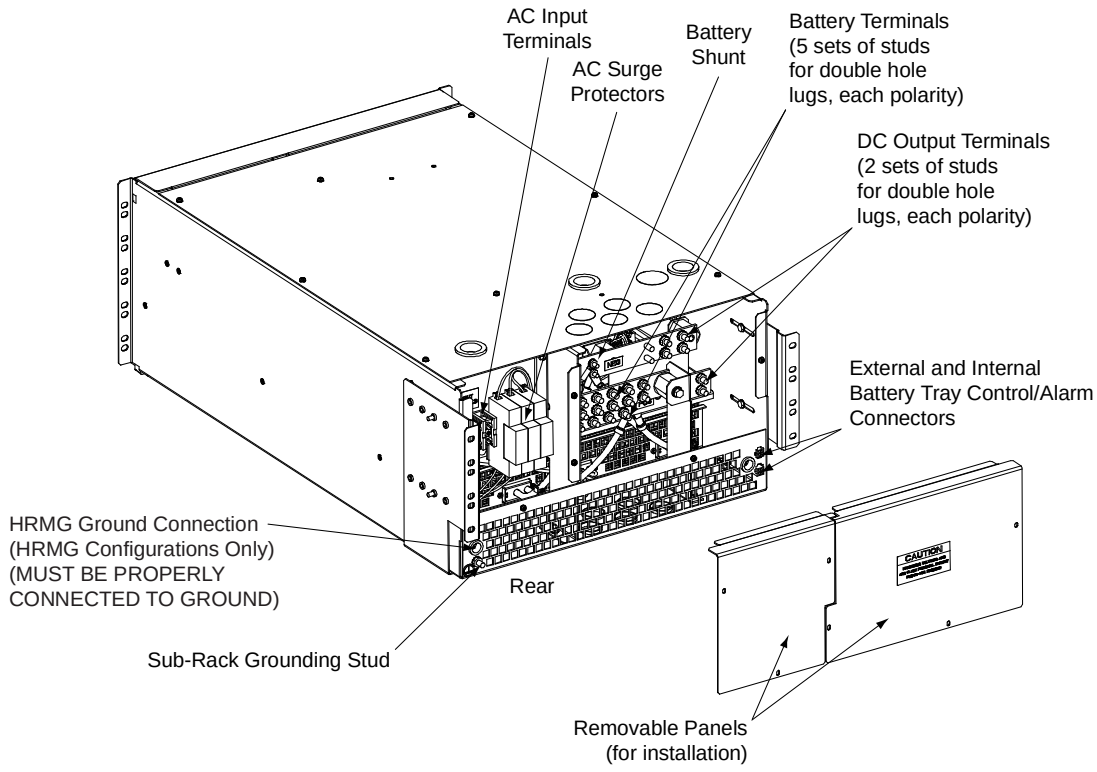


Optional Battery Tray(s)
(4U each)
(List 91 and 92)

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Power and Control Sub-Rack - Lists 11 (HRMG) and List 12 (NPG)

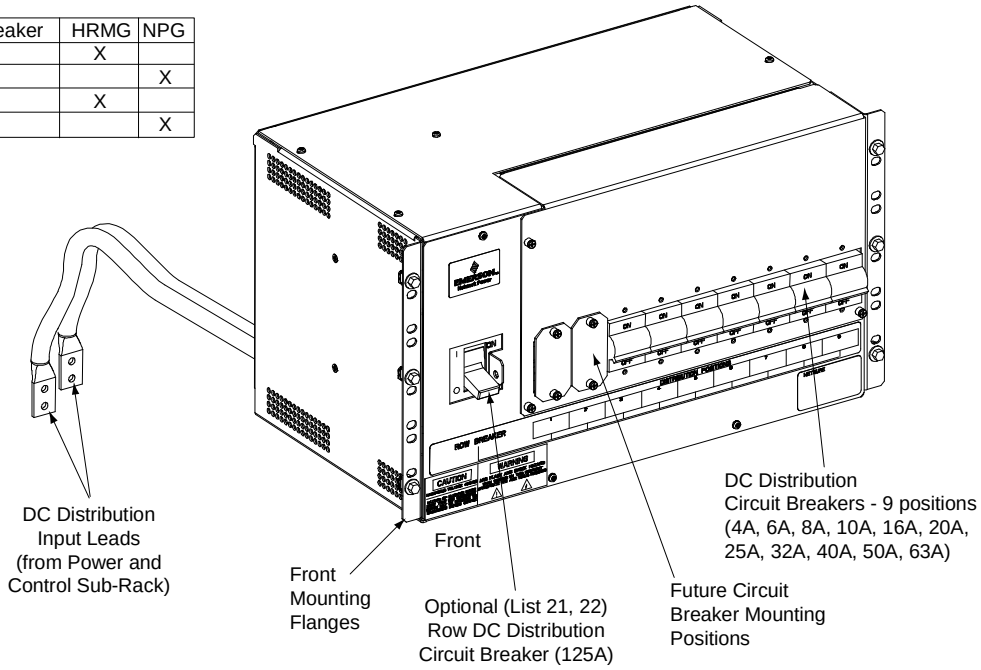

Battery Leads Openings for 19mm (0.75") Conduit (top and bottom)
AC Input Leads Opening for 25mm (1") Conduit
DC Output Leads Openings for 32mm (1.25") Conduit
Alarm Leads Opening for 25mm (1") Conduit
System Shutdown Button
Rectifier Module AC Input Circuit Breakers (40A, 380V/400V/480V AC)
Adjustable Rear Mounting Brackets
Front
Front Mounting Flanges
ACU+ Controller
ACU+ Interface Board (IB2) (behind cover)
Rectifier Modules


AC Input Terminals
AC Surge Protectors
Battery Shunt
Battery Terminals (5 sets of studs for double hole lugs, each polarity)
DC Output Terminals (2 sets of studs for double hole lugs, each polarity)
External and Internal Battery Tray Control/Alarm Connectors
HRMG Ground Connection (HRMG Configurations Only) (MUST BE PROPERLY CONNECTED TO GROUND)
Rear
Sub-Rack Grounding Stud
CAUTION
Removable Panels (for installation)

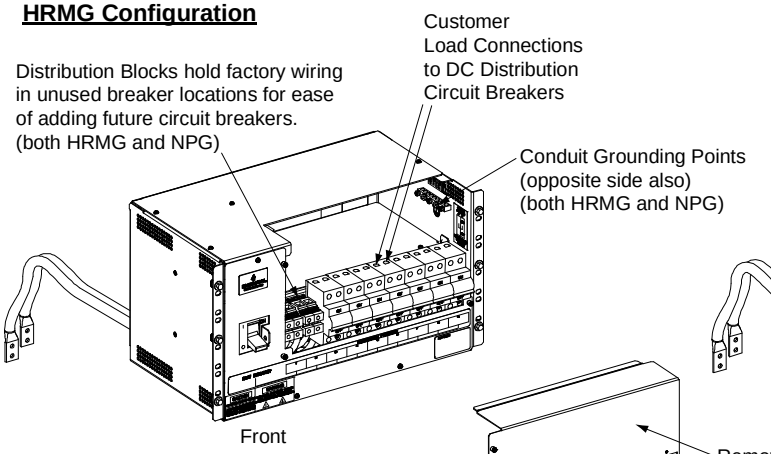
This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Load Distribution Sub-Rack – List 21-24

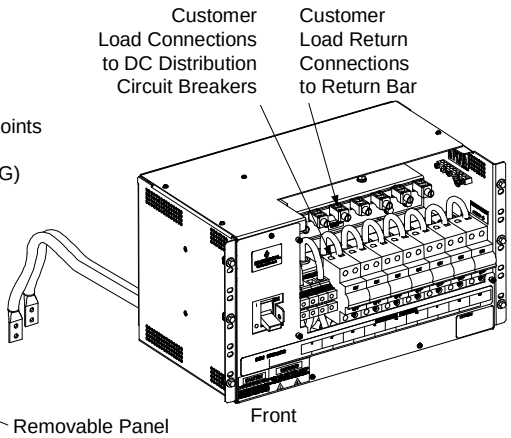
List	Row Breaker	HRMG	NPG
21	X	X	
22	X		X
23		X	
24			X

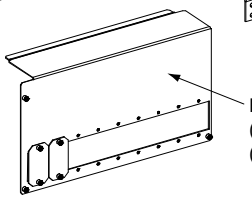


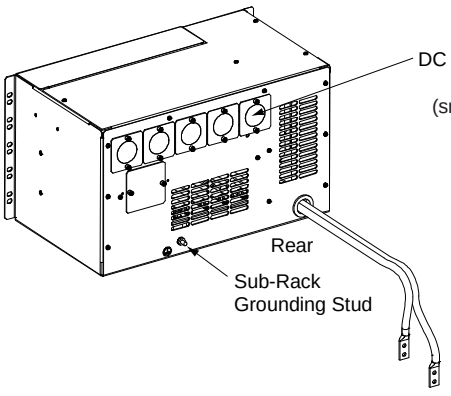
HRMG Configuration

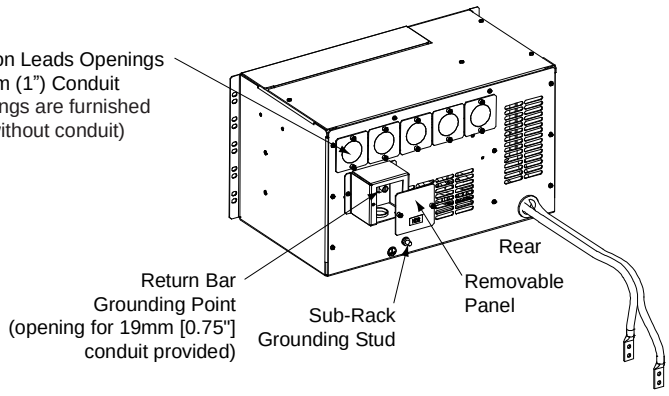


NPG Configuration



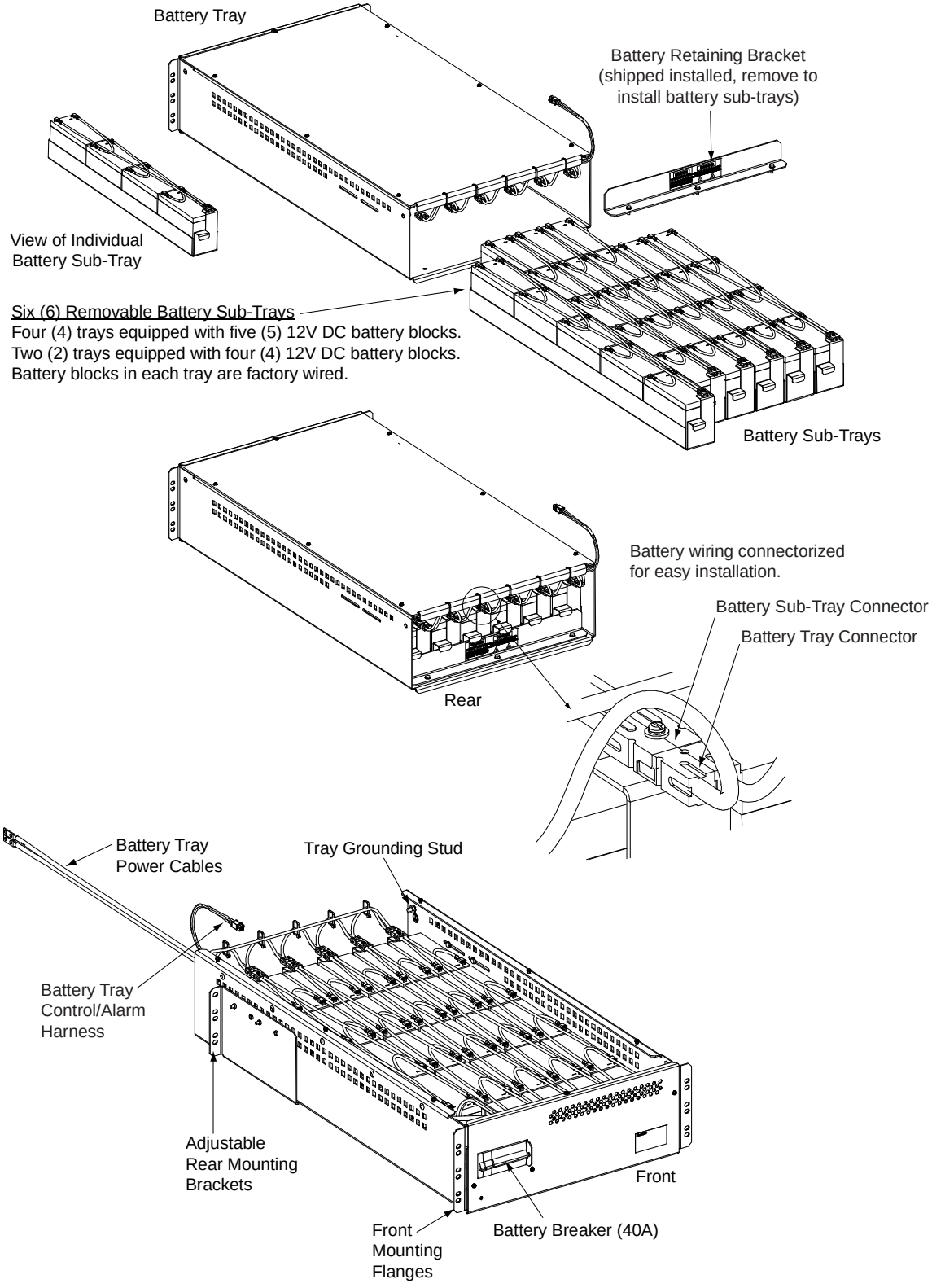






This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Battery Tray - List 91 (HRMG) and List 92 (NPG)



This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

LIST DESCRIPTIONS

List Number	Part Number	Description	Rack Unit Height
11	58400030011	Power and Control Sub-Rack – HRMG (High Resistance Midpoint Grounded) Systems	6U
12	58400030012	Power and Control Sub-Rack – NPG (Negative Pole Grounded) Systems	6U
21	58400030021	Load Distribution Sub-Rack with Row Breaker – HRMG (High Resistance Midpoint Grounded) Systems	6U
22	58400030022	Load Distribution Sub-Rack with Row Breaker – NPG (Negative Pole Grounded) Systems	6U
23	58400030023	Load Distribution Sub-Rack without Row Breaker – HRMG (High Resistance Midpoint Grounded) Systems	6U
24	58400030024	Load Distribution Sub-Rack without Row Breaker – NPG (Negative Pole Grounded) Systems	6U
91	58400030091	Battery Tray – HRMG (High Resistance Midpoint Grounded) Systems	4U
92	58400030092	Battery Tray – NPG (Negative Pole Grounded) Systems	4U
R1	584000300R1	Rack Integration (Factory Integrated System) 24U, 19”	24U
R2	584000300R2	Rack Integration (Factory Integrated System) 42U, 19”	42U
98	58400030093	Temperature Probe, 12 Feet (4m)	--
99	58400030094	Temperature Probe, 33 Feet (10m)	--

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Power and Control Sub-Rack

List 11: Power and Control Sub-Rack – HRMG (High Resistance Midpoint Grounded) Systems

Features

- Provides the power and control sub-rack.
- Provides two (2) rectifier mounting positions. A rectifier mounting position blank cover panel, P/N 553319, is furnished for each empty rectifier mounting position in the system.
- Provides one (1) Model M820N ACU+ system controller. Provides the ACU+ IB2 interface board. Provides a ground fault detection circuit. Provides a "System Shutdown" circuit.

Restrictions

Must be mounted in customer provided IT rack, unless ordered with List R1 or R2.

Must be used in a high resistance midpoint grounded application (±200V DC).

Ordering Notes

1) Order one (1) power and control sub-rack per system.
2) Order up to two (2) rectifiers (P/N 1R40015000e) per power and control sub-rack.
3) If ordered with List R1 or R2, factory programs ACU+ Controller for ordered configuration. If ordered separately for customer integration, customer needs to program ACU+ for final configuration.

List 12: Power and Control Sub-Rack – NPG (Negative Pole Grounded) Systems

Features

- Provides the power and control sub-rack.
- Provides two (2) rectifier mounting positions. A rectifier mounting position blank cover panel, P/N 553319, is furnished for each empty rectifier mounting position in the system.
- Provides one (1) Model M820N, ACU+ system controller. Provides the ACU+ IB2 interface board. Provides a "System Shutdown" circuit.

Restrictions

Must be mounted in customer provided IT rack, unless ordered with List R1 or R2.

Must be used in a negative pole grounded system (+400V DC, -0V DC).

Ordering Notes

1) Order one (1) power and control sub-rack per system.
2) Order up to two (2) rectifiers (P/N 1R40015000e) per power and control sub-rack.
3) If ordered with List R1 or R2, factory programs ACU+ Controller for ordered configuration. If ordered separately for customer integration, customer needs to program ACU+ for final configuration.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Load Distribution Sub-Rack

List 21: Load Distribution Sub-Rack with Row Breaker – HRMG (High Resistance Midpoint Grounded) Systems

Features

- Provides the load distribution sub-rack with one (1) row of distribution and a main distribution breaker for **UL applications**.
- Provides nine (9) circuit breaker positions. (See restrictions.)
- Accepts 4A to 63A DIN-rail type load circuit breakers.
- Rated for up to 100 amperes of distribution.
- Includes Row Breaker lockout/tagout bracket. (Note: Load breaker lockout/tagout ordered separately.)

Restrictions

Must be mounted in customer provided IT rack, unless ordered with List R1 or R2.

Must be used in a high resistance midpoint grounded application.

Must be used with List 11.

Circuit breakers are mounted right to left, starting with the highest capacity and working to the lowest capacity.

A circuit breaker with a rating of 63A shall have an empty mounting position between it and any other overcurrent protective device rated 10A or greater.

Ordering Notes

1) Order up to two (2) load distribution sub-racks per system.
2) Order load circuit breakers as required per "Load Distribution Devices" on page 17.
3) Order load circuit breaker lockout/tagout as required per "Load Distribution Devices" on page 17.

List 22: Load Distribution Sub-Rack with Row Breaker – NPG (Negative Pole Grounded) Systems

Features

- Provides the load distribution sub-rack with one (1) row of distribution and a main distribution breaker for **UL applications**.
- Provides nine (9) circuit breaker positions. (See restrictions.)
- Accepts 4A to 63A DIN-rail type load circuit breakers.
- Rated for up to 100 amperes of distribution.
- Includes Row Breaker lockout/tagout bracket. (Note: Load breaker lockout/tagout ordered separately.)

Restrictions

Must be mounted in customer provided IT rack, unless ordered with List R1 or R2.

Must be used with List 12.

Circuit breakers are mounted right to left, starting with the highest capacity and working to the lowest capacity.

A circuit breaker with a rating of 63A shall have an empty mounting position between it and any other overcurrent protective device rated 10A or greater.

Ordering Notes

1) Order up to two (2) load distribution sub-racks per system.
2) Order load circuit breakers as required per "Load Distribution Devices" on page 17.
3) Order load circuit breaker lockout/tagout as required per "Load Distribution Devices" on page 17.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

List 23: Load Distribution Sub-Rack without Row Breaker – HRMG (High Resistance Midpoint Grounded) Systems

Features

- Provides the load distribution sub-rack with one (1) row of distribution.
- Provides nine (9) circuit breaker positions. (See restrictions.)
- Accepts 4A to 63A DIN-rail type load circuit breakers.
- Rated for up to 100 amperes of distribution.

Restrictions

Must be mounted in customer provided IT rack, unless ordered with List R1 or R2.

Must be used in a high resistance midpoint grounded application.

Must be used with List 11.

Not for use in UL Listed systems.

Circuit breakers are mounted right to left, starting with the highest capacity and working to the lowest capacity.

A circuit breaker with a rating of 63A shall have an empty mounting position between it and any other overcurrent protective device rated 10A or greater.

Ordering Notes

1) Order up to two (2) load distribution sub-racks per system.
2) Order load circuit breakers as required per "Load Distribution Devices" on page 17.
3) Order load circuit breaker lockout/tagout as required per "Load Distribution Devices" on page 17.

List 24: Load Distribution Sub-Rack without Row Breaker – NPG (Negative Pole Grounded) Systems

Features

- Provides the load distribution sub-rack with one (1) row of distribution.
- Provides nine (9) circuit breaker positions. (See restrictions.)
- Accepts 4A to 63A DIN-rail type load circuit breakers.
- Rated for up to 100 amperes of distribution.

Restrictions

Must be mounted in customer provided IT rack, unless ordered with List R1 or R2.

Must be used with List 12.

Not for use in UL Listed systems.

Circuit breakers are mounted right to left, starting with the highest capacity and working to the lowest capacity.

A circuit breaker with a rating of 63A shall have an empty mounting position between it and any other overcurrent protective device rated 10A or greater.

Ordering Notes

1) Order up to two (2) load distribution sub-racks per system.
2) Order load circuit breakers as required per "Load Distribution Devices" on page 17.
3) Order load circuit breaker lockout/tagout as required per "Load Distribution Devices" on page 17.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Battery Tray

List 91: Battery Tray – HRMG (High Resistance Midpoint Grounded) Systems

Features

- Provides an internal battery tray with cabling for one 400V battery string. May be provided with or without twenty-eight (28) 12V battery blocks.
- Six (6) individual sub-trays for easy installation.
- Refer to Battery Backup Time table for battery backup time.

Restrictions

Must be mounted in customer provided IT rack, unless ordered with List R1 or R2.

Must be used in a high resistance midpoint grounded application.

May not be used in combination with external battery strings.

Must order two (2) or more battery trays if 40A or larger load circuit breakers are specified.

Must be used with List 11.

Ordering Notes

1) Must order battery sub-tray kit per table below for each battery tray ordered.
2) Order up to five (5) battery trays per system. The total number of internal or external battery strings cannot exceed five (5).

List 92: Battery Tray – NPG (Negative Pole Grounded) Systems

Features

- Provides an internal battery tray with cabling for one 400V battery string. May be provided with or without twenty-eight (28) 12V battery blocks.
- Six (6) individual sub-trays for easy installation.
- Refer to Battery Backup Time table for battery backup time.

Restrictions

Must be mounted in customer provided IT rack, unless ordered with List R1 or R2.

Must be used in a negative pole grounded application.

May not be used in combination with external battery strings.

Must order two (2) or more battery trays if 40A or larger load circuit breakers are specified.

Must be used with List 12.

Ordering Notes

1) Must order battery sub-tray kit per table below for each battery tray ordered.
2) Order up to five (5) battery trays per system. The total number of internal or external battery strings cannot exceed five (5).

Battery Sub-Tray Kits		Notes
Battery Type	**Battery Sub-Tray Kit P/N**	
Enersys NPX-35TFR	553524	Battery sub-tray kit P/N 553524 consists of six battery sub-trays and Emerson supplied batteries factory cabled.
None	554564	Battery sub-tray kit P/N 554564 consists of six battery sub-trays and cables without batteries.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Battery Backup Time (minutes)

Number of Strings / Trays					
Load	**1**	**2**	**3**	**4**	**5**
5kW	15	50	>60	>60	>60
10kW	9	18	31	44	50
15kW		10	18	27	32
20kW		7	12	18	24
25kW		5	8	13	18
30kW			6	10	13

Note: *Backup times based on 25˚C ambient with fully charged batteries.*

Temperature Probes

List 98: Temperature Probe, 12 Feet (4m) Total Cable Length

Features

- Up to two (2) temperature probes can be connected to the IB2 (ACU+ Interface Board). Any combination of the two (2) temperature probes can be programmed to monitor ambient air temperature and/or battery temperature. A temperature probe set to monitor battery temperature can also be used for the rectifier battery charge temperature compensation feature. The battery charge temperature compensation feature allows the controller to automatically increase or decrease the output voltage of the system to maintain battery float current as battery temperature decreases or increases, respectively. Battery life can be extended when an optimum charge voltage to the battery with respect to temperature is maintained. A temperature probe set to monitor battery temperature can also be used for the BTRM (battery thermal runaway management) feature. The BTRM feature lowers output voltage when a high temperature condition exist to control against battery thermal runaway.
- The Temperature Probe assembly consists of two pieces that plug together to make a complete 12 feet (4m) probe: P/N 04118246 (3 feet [1m] long) and P/N 04118247 (9 feet [3m] long).

Restrictions

A temperature probe programmed to monitor battery temperature should be mounted on the top or side of a battery block to sense battery temperature. A temperature probe used for battery charge temperature compensation and/or BTRM (Battery Thermal Runaway Management) should also be mounted on the top or side of a battery block. A temperature probe programmed to monitor ambient temperature should be mounted in a convenient location, away from direct sources of heat or cold. Recommended battery probe location provided in IM584000300 (Installation Instructions).

Ordering Notes

1) Order up to two (2) Temperature Probes for each system, as required. (Each List 98 includes one (1) P/N 04118246 and one (1) P/N 04118247, and together makes up one temperature probe.)

List 99: Temperature Probe, 33 Feet (10m) Total Cable Length

Features

- See above for description of Temperature Probes.
- The Temperature Probe assembly consists of two pieces that plug together to make a complete 33 feet (10m) probe: P/N 04118246 (3 feet [1m] long) and P/N 04116740 (30 feet [9m] long).

Restrictions

See above for restrictions.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Ordering Notes

1) Order up to two (2) Temperature Probes for each system, as required. (Each List 99 includes one (1) P/N 04118246 and one (1) P/N 04116740, and together makes up one temperature probe.)

Rack Integration (Factory Integrated System)

List R1: 24U, 19"

Features

- Provides factory integration of selected sub-racks (as ordered above) in a 24U Emerson Network Power DCM IT Rack.

Restrictions

Total height of all sub-racks ordered cannot exceed 24U.
(See page 6 for individual component rack unit heights.)

Ordering Notes

1) For a factory integrated system, order List R1. Also order sub-racks by List Numbers as described above.
2) Must select top plate hole sizing (see illustration below).

List R2: 42U, 19"

Features

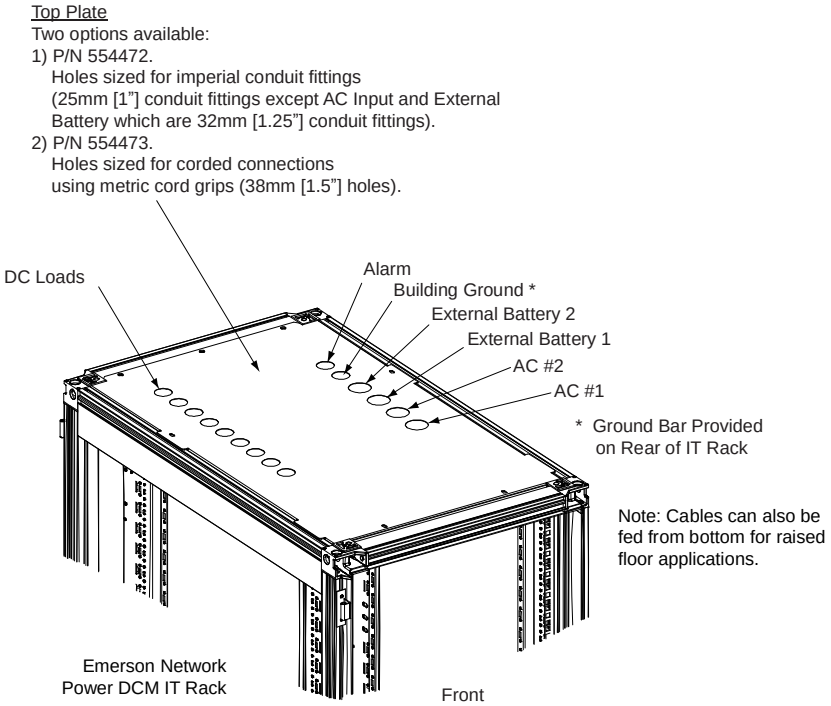
- Provides factory integration of selected sub-racks (as ordered above) in a 42U Emerson Network Power DCM IT Rack.

Restrictions

Total height of all sub-racks ordered cannot exceed 42U.
(See page 6 for individual component rack unit heights.)

Ordering Notes

1) For a factory integrated system, order List R2. Also order sub-racks by List Numbers as described above.
2) Must select top plate hole sizing (see illustration below).


Top Plate
Two options available:
1) P/N 554472.
Holes sized for imperial conduit fittings
(25mm [1"] conduit fittings except AC Input and External Battery which are 32mm [1.25"] conduit fittings).
2) P/N 554473.
Holes sized for corded connections
using metric cord grips (38mm [1.5"] holes).
DC Loads
Alarm
Building Ground *
External Battery 2
External Battery 1
AC #2
AC #1
* Ground Bar Provided on Rear of IT Rack
Note: Cables can also be fed from bottom for raised floor applications.
Emerson Network Power DCM IT Rack
Front

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

ACCESSORY DESCRIPTIONS

DC Load Distribution Devices

DIN-Rail Type Load Circuit Breakers

Features

- Each distribution position in the load distribution sub-rack is factory furnished with a distribution block and cover (for ease of adding circuit breakers in the field). When circuit breakers are specified on initial order, the factory replaces the distribution block and cover with the specified circuit breaker. When breakers are ordered separately for field installation, this same procedure must be performed. See UM584000300 (Operation Instructions) for details.
- Each circuit breaker is a 2-pole device and occupies one circuit breaker mounting position in the load distribution sub-rack. The load distribution sub-rack has nine (9) circuit breaker mounting positions.

Restrictions

Load should not exceed 80% of device rating.

Only breakers specified in Table 1 are to be used. NO substitutions are acceptable.

Ordering Notes

1) Order circuit breakers as required per Table 1.

Output Load Circuit Breaker Selection

Refer to the following guidelines in addition to following local codes and practices.

- Systems with Batteries
  a) Define the power requirement of circuit to be protected (ex. 5000W) [assume constant power electronic load].
  b) Determine the minimum system voltage per the system design parameters (including any voltage drop accounted for to the load). This will generally occur at the end of battery discharge and this voltage value should not exceed the minimum rated operating voltage of devices on this circuit.
  c) Divide circuit power in step a) by the voltage determined in step b). This represents the maximum discharge current that the breaker must accommodate.
  d) Round up to the next breaker size.
  e) Check: Divide maximum circuit power in step a) by the normal system operating or float voltage (e.g. 378V DC). This is the normal operating current. Multiply this value by 1.25 to account for breaker derating factor per the NEC. Round up to the next breaker size.
  f) Breaker size required is the larger of step d) or e).

     Example

     5000W / 260V DC (minimum device voltage) = 19.2A, round up to 20A breaker.

     Check: 5000W / 378V DC = 13.2A x 1.25 = 16.5A, round up to 20A breaker.
- Systems without Batteries
  a) Define power requirements of circuit to be protected (ex. 5000W) [assume constant power electronic load].
  b) Divide circuit power in step a) by the system operating / float voltage (e.g. 378V DC). This is the normal operating current. Multiply this value by 1.25 to account for breaker derating factor per the NEC. Round up to next breaker size.

     Example

     5000W / 378V DC = 13.2A x 1.25 = 16.5A, round up to 20A breaker.

Note: *Select wire gauge per Table 8 for each circuit. Note that Table 8 is only for two (2) conductors per conduit. For more than two (2) conductors per conduit, establish a current value equivalent to 80% of the breaker size determined from the formula in the above procedures to calculate the wire sizes per the NEC. Do not exceed the ratings of the device / load when coordinating with a system operated with battery back up.*

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

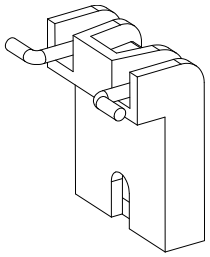
Ampere Rating	Circuit Breaker Part Number	Lockout/Tagout Assembly
4A	144974	 P/N 145289
6A	144923	
8A	144924	
10A	144925	
16A	144928	
20A	144929	
25A	144930	
32A	144932	
40A	144887	
50A	144933	
63A	144959	

Table 1
DIN-Rail Type Circuit Breakers

Load Circuit Breaker Lockout/Tagout Assembly

Features

- Allows the distribution circuit breakers to be padlocked in the off position.

Ordering Notes

1) Order a lockout/tagout assembly (P/N 145289) for each circuit breaker, as desired.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

User Replaceable Components

Ordering Notes

1) Refer to Table 2 for replacement assemblies.

Item	Part Number
Rectifier	1R40015000e
Rectifier Fan	32010086
ACU+ Controller	1M820NNB
ACU+ IB2 Interface Board	MA4C5U31
Internal AC Input Surge Protector Module	144893
DC Load Distribution Circuit Breakers	(see previous page)

Table 2
Replacement Assemblies

2) Typical batteries supplied or approved for use in this system are listed in Table 3. For other batteries, contact Emerson.

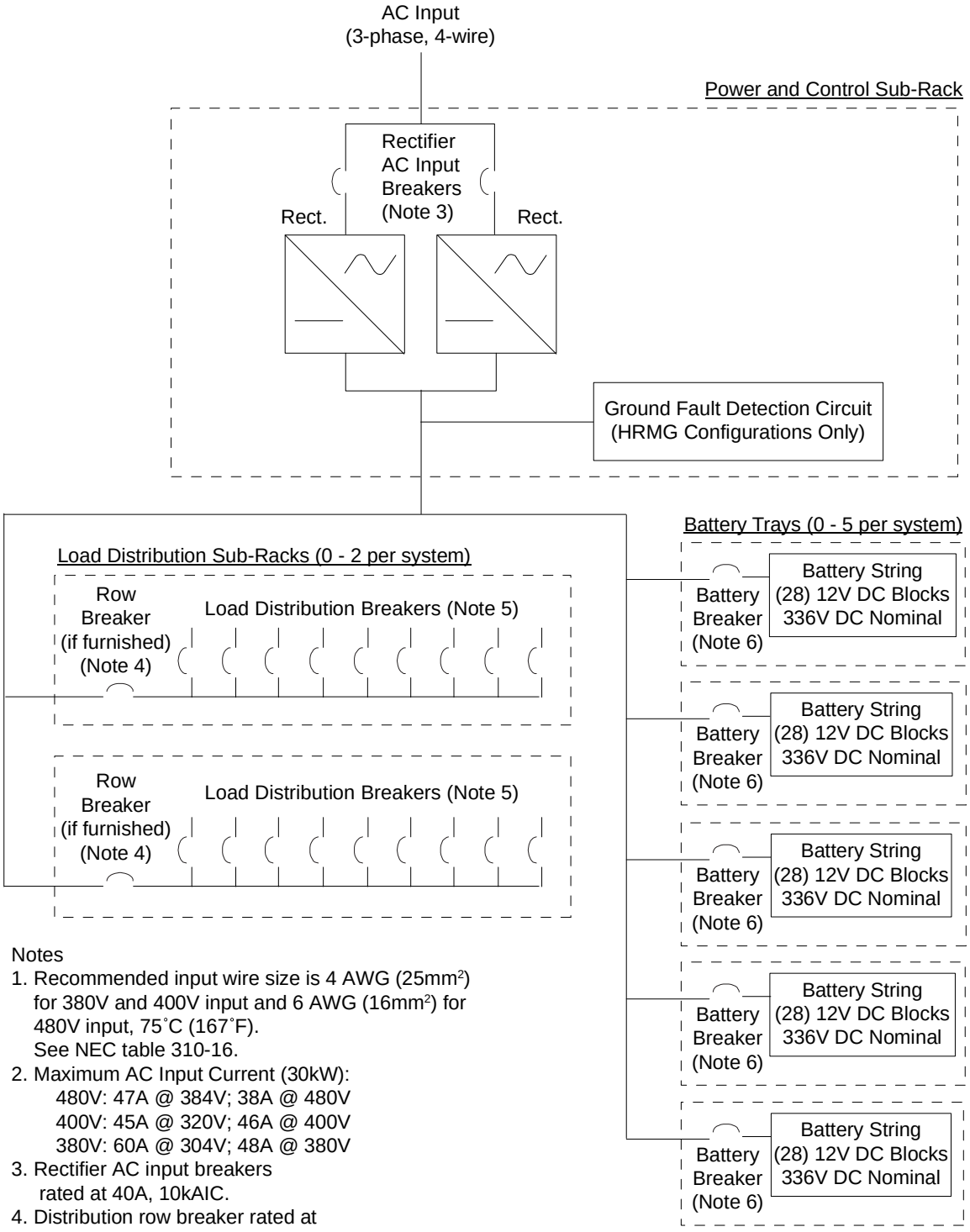
Manufacturer*	Model	Emerson Network Power P/N	Rated 8-Hr. Capacity (Ah)	Watts Per Cell (Wpc)	Dimension W x L x H	Weight (per battery)
Enersys	NPX-35TFR	144623	8.5	35	65mm x 151mm x 100mm (2.56" x 5.94" x 3.94")	2.76kg (6.1 lbs)

* *See Battery Manufacturer Information located at the end of this document.*

Table 3
Batteries

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

ONE LINE DIAGRAM



Notes

1. Recommended input wire size is 4 AWG (25mm^2) for 380V and 400V input and 6 AWG (16mm^2) for 480V input, 75˚C (167˚F). See NEC table 310-16.
2. Maximum AC Input Current (30kW):
   480V: 47A @ 384V; 38A @ 480V
   400V: 45A @ 320V; 46A @ 400V
   380V: 60A @ 304V; 48A @ 380V
3. Rectifier AC input breakers rated at 40A, 10kAIC.
4. Distribution row breaker rated at 125A, 65kAIC (if furnished).
5. Individual DC distribution load breakers rated at 4A, 6A, 8A, 10A, 16A, 20A, 25A, 32A, 40A, 50A, and/or 63A, 6kAIC.
6. Battery breaker rated at 40A, 6kAIC.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

RECOMMENDED WIRING SIZES, BRANCH CIRCUIT PROTECTION, AND CRIMP LUGS

Equipment Grounding

For equipment grounding requirements, refer to the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC), applicable local codes, and your specific site requirements. For operation in countries where the NEC is not recognized, follow applicable codes.

Factory Furnished IT Rack Frame Grounding

When the system is pre-assembled and pre-wired in a factory furnished IT rack (List R1, R2), grounding leads are factory wired from the individual system sub-racks to a ground bar located on the rear left side of the furnished IT rack. Customer is required to run a grounding cable from this ground bar to site ground. Refer to Table 4 for recommended grounding wire size and lug selection.

Factory Furnished IT Rack Frame Grounding (Grounding Studs for Lug Connection Provided)		
Recommended Wire Size	**Lug Requirements**	**Recommended Lug (Emerson P/N)**
8 AWG ($10mm^2$)	2-Hole, 1/4" Bolt Clearance Holes, 5/8" Centers	245390200

Table 4
Recommended Factory Furnished IT Rack Frame Grounding Wire Size and Lug

Sub-Rack Frame Grounding (for systems installed in a customer furnished IT rack)

When system components are provided individually to be installed in a customer furnished IT rack, the individual sub-racks must be grounded on site by the customer.

A grounding stud is located on the rear of the power and control sub-rack and distribution sub-rack. A grounding stud is located on the rear side panel of the battery tray.

Refer to Table 5 for recommended grounding wire size and lug selection. For convenience, grounding cables are furnished loose with each sub-rack as shown in Table 5. These cables are assembled with the 2-hole lug listed in Table 4 on one end and the 1-hole lug listed in Table 5 on the other end.

Sub-Rack Frame Grounding (Grounding Stud for Lug Connection Provided)			
Recommended Wire Size	**Lug Requirements**	**Recommended Lug (Emerson P/N)**	**Furnished Grounding Cable**
8 AWG ($10mm^2$)	1-Hole, 1/4” Bolt Clearance Hole	245359690	Power and Control Sub-Rack: P/N 554932, 584mm (23”). Load Distribution Sub-Rack: P/N 554931, 864mm (34”). Battery Tray: P/N 554934, 1575mm (62”).

Table 5
Recommended Sub-Rack Frame Grounding Wire Size and Lug

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Return Busbar (-Bus) Grounding (NPG Configurations Only)

The return busbar (–Bus) in a negative pole ground (NPG) configuration is to be connected to ground. A grounding connection point for the return busbar (-Bus) is provided on the negative bus in the power and control sub-rack. This connection can also be made on the rear of the load distribution sub-rack, if furnished.

Note: *When the system is pre-assembled and pre-wired in a factory furnished IT rack (List R1, R2), a grounding lead is factory connected between the –Bus in the power and control sub-rack and the rack ground bar located on the rear left side of the furnished IT rack.*

Refer to Table 6 for recommended grounding wire size and lug selection. For convenience, a grounding cable is furnished loose as shown in Table 6.

Return Busbar (-Bus) Grounding			
Recommended Wire Size	**Lug Requirements**	**Recommended Lug (Emerson P/N)**	**Furnished Grounding Cable**
4 AWG ($25mm^2$)	**To Power and Control Sub-Rack:** 2-Hole, 1/4” Bolt Clearance Holes, 5/8" Centers	245346800	P/N 555262, 965mm (38”), terminated on both ends with lug P/N 245346800.
	To Load Distribution Sub-Rack: None (screw-clamp type terminal provided)	--	--

Table 6
Recommended Return Busbar (-Bus) Grounding Wire Size and Lug (NPG Configurations Only)

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

AC Input (Power and Control Sub-Rack)

Refer to Table 7 for recommended branch circuit protection, wire sizes, and lugs.

AC INPUT The system requires one AC feed which provides input power for the two rectifiers. (Screw-Clamp Type Terminals Provided)				
Input Voltage (3-Phase)	**Maximum Input Current (30kW)**	**Recm. Branch Circuit Protection [1]**	**+35°C Ambient Temperature**	
			Recm. Wire Size [2, 3, 4]	**Conduit Size [5] (if used)**
380V AC	48A	63A [6]	4 AWG ($25mm^2$)	1” (25mm)
400V AC	46A	63A [6]	4 AWG ($25mm^2$)	1” (25mm)
480V AC	38A	50A [7]	6 AWG ($16mm^2$)	3/4” (19mm)

AC INPUT GROUNDING LEAD (Grounding Studs for Lug Connection Provided)		
Lug Requirements	**Wire Size**	**Recommended Lug (Emerson P/N)**
2-Hole, 10-32 Bolt Clearance Holes, 5/8" Centers	Same as AC Input	4 AWG ($25mm^2$): 245350300 (single hole lug)
		6 AWG ($16mm^2$): 245346500 (double hole lug)

[1] The AC input branch circuit protective device should be of the time-delay or high inrush type.

[2] Wire sizes based on recommendations of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC). Table 310-16 for copper wire at 75°C conductor temperature operating in ambient of +35°C was used. For other operating ambient temperatures, refer to the National Electrical Code. For operation in countries where the NEC is not recognized, follow applicable codes.

[3] Equipment grounding conductors must be provided with the AC input conductors supplied to the shelf. Frame ground terminals must be connected to earth ground, not power system neutral. Equipment grounding conductor size based on recommendations of the NEC Table 250-122 for copper wire. If aluminum or copper clad aluminum grounding conductor is used, refer to Table 250-122 for increased conductor size. For operation in countries where the NEC is not recognized, follow applicable codes.

[4] THHW 75°C wire.

[5] Conduit sized for three (3) current carrying conductors and one (1) ground conductor per conduit (based on NEC recommendations). For operation in countries where the NEC is not recognized, follow applicable codes. When using power cords, power cords must meet the temperature and voltage requirements for the installation.

[6] The minimum OCPD is 60A and the maximum OCPD is 70A.

[7] The minimum OCPD is 50A and the maximum OCPD is 60A.

Table 7
Recommended AC Input Branch Circuit Protection and Wire Sizes

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

DC Load Distribution (Distribution Sub-Rack)

Refer to Table 8 for recommended wire sizes and lugs.

DC Load Distribution (Screw-Clamp Type Terminals Provided) HRMG (High Resistance Midpoint Ground) Configuration: Distribution leads are connected to the distribution devices. NPG (Negative Pole Ground) Configuration: Distribution leads are connected to the distribution devices and return busbar.		
Over Current Protective Device [1]	**+35°C Ambient Temperature**	
	Recm. Wire Size [2, 3]	**Conduit Size [4] (if used)**
4A, 6A, 8A, 10A	14 AWG (2.5mm^2)	1/2" (13mm)
16A, 20A	12 AWG (4mm^2)	1/2" (13mm)
25A	10 AWG (6mm^2)	1/2" (13mm)
32A	8 AWG (10mm^2)	1/2" (13mm)
40A	8 AWG (10mm^2)	1/2" (13mm)
50A	8 AWG (10mm^2)	1" (25mm)
63A	6 AWG (16mm^2)	1" (25mm)

[1] Load should not exceed 80% of device rating.

[2] Wire sizes based on recommendations of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC). Table 310-16 for copper wire at 75°C conductor temperature operating in ambient of 35°C was used. For other operating ambient temperatures, refer to the NEC. For operation in countries where the NEC is not recognized, follow applicable codes.

[3] THHW 75°C wire.

[4] Conduit sized for two (2) current carrying conductors and one (1) ground conductor per conduit (based on NEC recommendations). For operation in countries where the NEC is not recognized, follow applicable codes. When using power cords, power cords must meet the temperature and voltage requirements for the installation.

Table 8
Recommended DC Load Distribution Wire Sizes and Lugs

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

DC Load Distribution (Bulk Output from Power and Control Sub-Rack)

Refer to Table 9 for recommended wire sizes and lugs.

DC Load Distribution (Bulk Output from Power and Control Sub-Rack) (Studs for Lug Connection Provided)				
Distribution Voltage	**Maximum Output Current**	**Recommended Wire Size [1]**	**Lug Requirements**	**Recommended Lug (Emerson P/N)**
400V DC	89A	2 AWG ($35mm^2$)	2-Hole, 1/4” Bolt Clearance Holes, 5/8" Centers	245346900

[1] Wire sizes based on recommendations of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC). Table 310-16 for copper wire at 90°C conductor temperature operating in ambient of 35°C was used. For other operating ambient temperatures, refer to the NEC. For operation in countries where the NEC is not recognized, follow applicable codes.

Table 9
Recommended DC Load Distribution Wire Sizes and Lugs
When Used with Bulk Output from Power and Control Sub-Rack

External Controller Interface (Distribution Sub-Rack)

The IB2 (ACU+ Controller Interface Board) provides connection points for digital inputs and programmable relay outputs, as shown in the system installation instructions (IM584000300). Recommended wire size for these connections is 22 AWG ($0.5mm^2$) for loop lengths up to 200 feet (61m) and 18-20 AWG ($1mm^2$ - $0.75mm^2$) for loop lengths over 200 feet (61m).

Battery (Power and Control Sub-Rack)

The battery cables to the internal battery tray(s) are factory provided and sized accordingly. These cables are 8 AWG and terminated on the “Power and Control Sub-Rack” side with a P/N 245391600 lug.

Battery cables to external batteries should be sized per the current edition of the American National Standards Institute (ANSI) approved National Fire Protection Association's (NFPA) National Electrical Code (NEC), applicable local codes, and your specific site requirements. For operation in countries where the NEC is not recognized, follow applicable codes.

Two-hole lugs with 1/4" bolt clearance holes on 5/8" centers are required.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

SPECIFICATIONS

1. SYSTEM

1.1 System DC Output Ratings

1.1.1 Voltage: Nominal 400V DC. Adjustable between 290-400V DC.

1.1.2 Power: 30kW @ at Vout ≥ 336V DC.

1.1.3 Voltage Regulation: 0.5% from 1A to 37.5A per rectifier.

1.1.4 Grounding Configurations:

(A) HRMG (High Resistance Midpoint Ground)

(B) NPG (Negative Pole Ground)

1.2 System AC Input Ratings

1.2.1 Voltage: Nominal 380/400/480V AC, three phase, 4-wire, 50/60 Hz, with an operating range of 260 to 530V. Acceptable input frequency range is 45 to 65 Hz.

Derate to 50% of the output power from 260V to 304V AC.

1.2.2 Current: 380V AC, 48A.
400V AC, 46A.
480V AC, 38A.

1.2.3 Power Factor: 0.99 @ 100% load.

1.2.4 Inrush Current: Peak value < 1.5 times peak value of maximum steady state input current.

1.2.5 Efficiency: Peak: 97%.

1.2.6 THD:

(A) 380V AC 50Hz Input Voltage: <5% at 378V DC output 7500W~15KW load.

(B) 480V AC 60Hz Input Voltage: <6% at 378V DC output 15KW load.

1.3 System Environmental Ratings

1.3.1 Operating Ambient Temperature Range: -5°C to +45°C (+23°F to +113°F).
Full Rating: -5°C to +35°C (+23°F to +95°F).
Recommended with Batteries:
+20°C to +25°C (+68°F to +77°F).

1.3.2 Storage Ambient Temperature Range: -40°C to +70°C (-40°F to +158°F).

1.3.3 Heat Rejection: 3070 BTU/hr (900W) maximum.

1.3.4 Humidity: Capable of operating in an ambient relative humidity range of 0% to 95%, non-condensing.

1.3.5 Altitude: Capable of operating in an altitude range of -200 feet to 10,000 feet. The maximum operating ambient temperature should be de-rated by 3°C per 1000 feet above 6000 feet.

1.3.6 Audible Noise: ≤ 55dB(A), at 25°C (measurement made at 1m distances in front of system at full load).

1.3.7 EMI: EN 300 386, Class A and FCC Part 15, Class A.

1.3.8 Mounting: This system is intended only for installation in a Restricted Access Location on or above a non-combustible surface and must be securely mounted to the floor.

1.3.9 Surge Protection: Compliance with EN61000-4-5 Installation Class 4, and capable of withstanding surges per ANSI/IEEE C 62.41 1999 Category B3 across the input terminals.

Note: *This level of protection is a widely used standard for telecommunications power equipment. As with all such equipment, it is the end user's responsibility to provide an adequately sized Surge Suppression Device (Type 1) at the commercial power service entrance of the building that reduces all incoming surges to levels below the classes/categories stated for the equipment.*

1.4 Physical

1.4.1 Form Factor: 19" Rack, EIA-310-D Compliant.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Home

1.5 System Compliance Information

1.5.1 Safety Compliance:

(A) All Lists: EN 60950-1; IEC 60950; CE Mark in accordance with the Low-Voltage Directive, 2006/95/EEC and the EMC Directive, 2004/108/EC including amendments by the CE Marking Directive, 93/68/EEC.

(B) All Lists Except List 23 and List 24: This product bears the combined UL Recognized mark for the United States and Canada per UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) and CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements).

(C) List R1 and R2: This product bears the combined UL Listed mark for the United States and Canada per UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) and CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements).

1.5.2 The system is RoHS compliant (pending).

2. RECTIFIER

For rectifier specifications, refer to the rectifier instructions (UM1R40015000e).

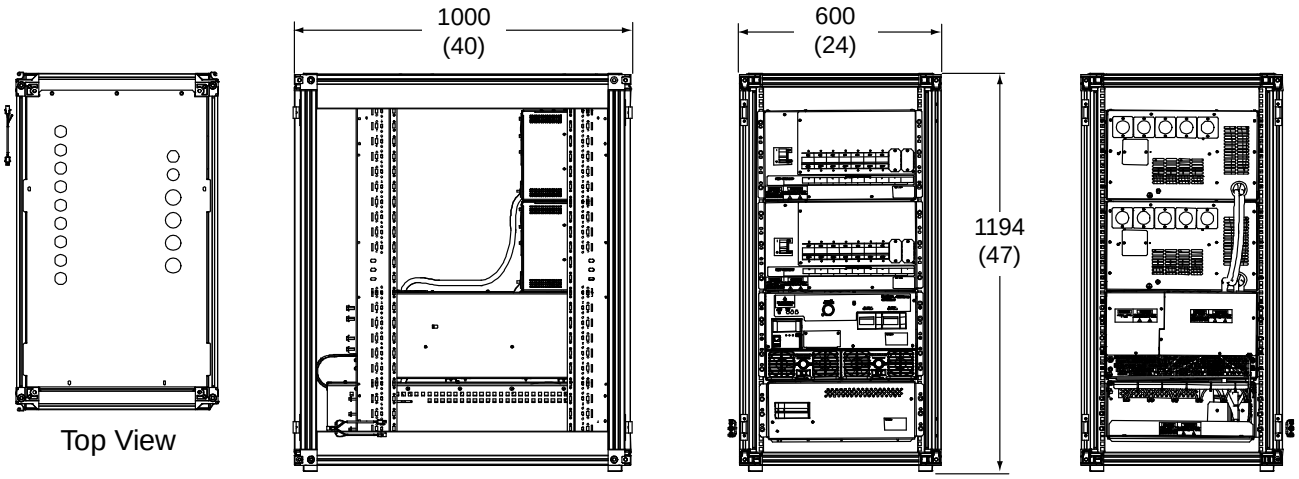
3. ACU+ CONTROLLER

For ACU+ Controller specifications, refer to the ACU+ controller instructions (UM1M820NNB-1).

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

MECHANICAL SPECIFICATIONS

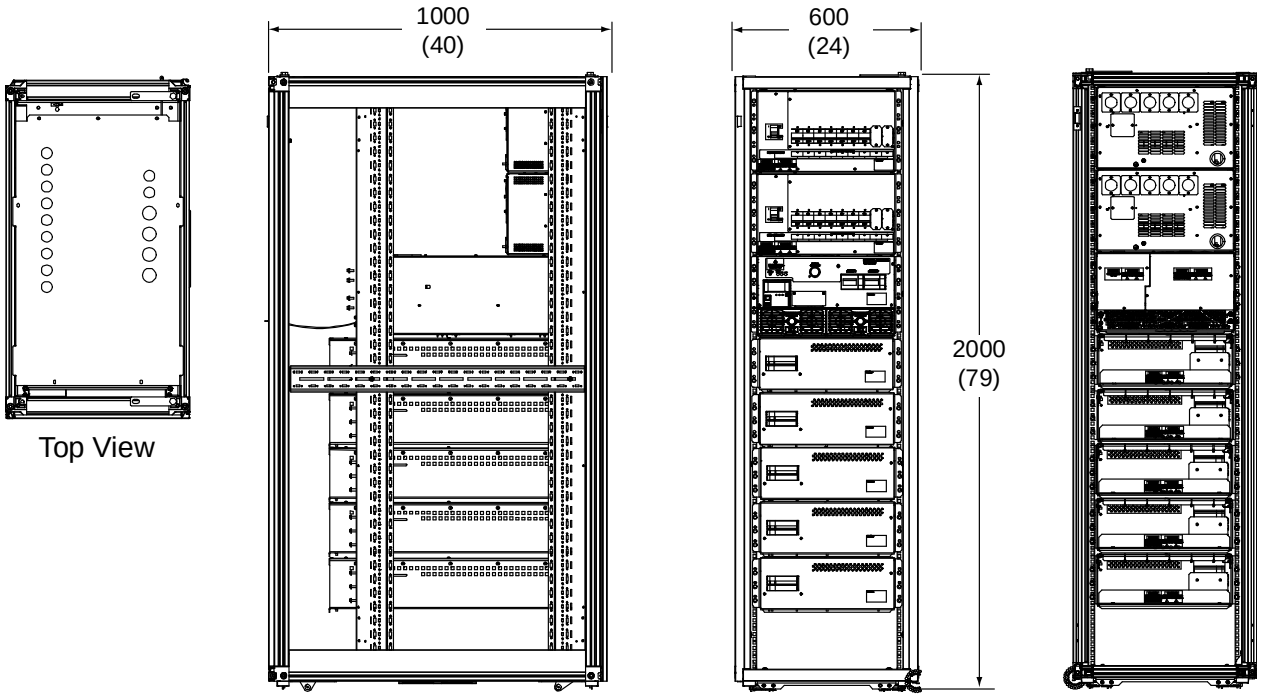
Rack Integrated System (24U) (List R1)



Top View | Left Side View | Front View | Rear View

Notes:
1. Dimensions are in mm (inches).
2. Finish: Black.
3. Doors/Sides removed in illustration for clarity.

Rack Integrated System (42U) (List R2)



Top View | Left Side View | Front View | Rear View

Notes:
1. Dimensions are in mm (inches).
2. Finish: Black.
3. Doors/Sides removed in illustration for clarity.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Dimensions and Weights

INSTALLED (metric / english)					
When Sold Separately:	**List #**	**H mm (in.)**	**W mm (in.)**	**D mm (in.)**	**Weight (A) Kg (lbs.)**
Power and Control Sub-Rack	11, 12	265 (10.5)	483 (19)	724 (28.5)	29.5 (65)
Load Distribution Sub-Rack (HRMG)	21, 23	257 (10)	483 (19)	257 (10)	16 (35)
Load Distribution Sub-Rack (NPG)	22, 24	258 (10)	483 (19)	317 (12.5)	16 (35)
Battery Tray (empty)	91, 92	177 (7)	483 (19)	838 (33)	27 (60)
Battery String		Fits Inside Battery Tray			91 (200)
Rectifier - 15kW	1R40015000e	88 (3.5)	218 (8.5)	565 (22)	10 (22)
When Factory Integrated:	**List #**	**H mm (in.)**	**W mm (in.)**	**D mm (in.)**	**Weight (B) Kg (lbs.)**
24U Rack	R1	1194 (47)	600 (24)	1000 (40)	70.5 (155)
42U Rack	R2	2000 (79)	600 (24)	1000 (40)	120 (265)
Total Installed Weight					*

* Add the weight of the selected components shown in column WEIGHT (A) to weight of rack shown in column WEIGHT (B) for **Total Installed Weight**.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

SHIPPING (metric / english)						
When Sold Separately:	**List #**	**H mm (in.)**	**W mm (in.)**	**D mm (in.)**	**Weight (A) Kg (lbs.)**	**Packaging Style**
Power and Control Sub-Rack	11, 12	750 (29.5)	1067 (42)	1067 (42)	40.5 (110)	Pallet
Load Distribution Sub-Rack (HRMG)	21, 23	432 (17)	585 (23)	712 (28)	20.5 (45)	Box
Load Distribution Sub-Rack (NPG)	22, 24	432 (17)	585 (23)	712 (28)	18.5 (40)	Box
Battery Tray (also choose 1 type of Sub-Tray Kit below, Sub-Tray Kits ship separately)	91, 92	407 (16)	1220 (48)	1220 (48)	41 (90)	Pallet
Sub-Tray Kit, with batteries (1 required per Battery Tray ordered) (ships separately)	553524	293 (11.5)	1067 (42)	1067 (42)	111.5 (245)	Pallet
Sub-Tray Kit, without batteries (1 required per Battery Tray ordered) (ships separately)	554564	293 (11.5)	1067 (42)	1067 (42)	27.5 (60)	Pallet
Rectifier - 15kW (ships separately)	1R40015000e	280 (11)	432 (17)	788 (31)	12 (26)	Box
When Factory Integrated:	**List #**	**H mm (in.)**	**W mm (in.)**	**D mm (in.)**	**Weight (B) Kg (lbs.)**	**Packaging Style**
24U Rack	R1	1372 (54)	966 (38)	1321 (52)	91 (200)	Pallet
42U Rack	R2	2159 (85)	966 (38)	1321 (52)	136 (300)	Pallet
Integrated System Shipping Weight					**	
	List #	**H mm (in.)**	**W mm (in.)**	**D mm (in.)**	**Weight (C) Kg (lbs.)**	**Packaging Style**
Sub-Tray Kit, with batteries (1 required per Battery Tray ordered)	553524	293 (11.5)	1067 (42)	1067 (42)	111.5 (245)	Pallet
Sub-Tray Kit, without batteries (1 required per Battery Tray ordered)	554564	293 (11.5)	1067 (42)	1067 (42)	27.5 (60)	Pallet
Rectifier - 15kW (ships separately)	1R40015000e	280 (11)	432 (17)	788 (31)	12 (26)	Box
Total Shipping Weight					***	

** Add the weight of the selected components shown in column WEIGHT (A) (excluding Sub-Tray Kit and Rectifier weights) to weight of rack shown in column WEIGHT (B) for *Integrated System Shipping Weight*.

*** Add the weight of the Sub-Tray Kit(s) and Rectifier(s) shown in column WEIGHT (C) to the *Integrated System Shipping Weight* for **Total Shipping Weight**.

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

RELATED DOCUMENTATION

Power System Installation Instructions:	IM584000300
Power System Operation Instructions:	UM584000300
ACU+ Controller Operation Instructions:	UM1M820NNB-1
Rectifier Instructions:	UM1R40015000e

BATTERY MANUFACTURER INFORMATION

Some equipment described in this System Application Guide is designed to accommodate batteries from various manufacturers. The following are referenced in this document.

PowerSafe Enersys™: EnerSys Inc., Reading, PA, 196212-4145

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.

Home

REVISION RECORD

Issue	Change Number (ECO)	Description of Change	Date	Approved
AA	LLP216775	New	12/12/2012	John Jasko
AB	LLP218630	Misc. updates. Dimensions and weights tabled revised.	04/05/2013	John Jasko John Jasko Apr 17, 2013 John Leitner Apr 17, 2013

Emerson Network Power, Energy Systems, North America, Inc.
4350 Weaver Parkway, Warrenville, IL 60555

Toll Free: 800-800-1280 (USA and Canada)
Telephone: 440-246-6999 **Fax:** 440-246-4876
Web: EmersonNetworkPower.com/EnergySystems
EnergyNet: Secure.EmersonNetworkPower.com

This document is property of Emerson Network Power, Energy Systems, North America, Inc. and contains confidential and proprietary information owned by Emerson Network Power, Energy Systems, North America, Inc. Any copying, use, or disclosure of it without the written permission of Emerson Network Power, Energy Systems, North America, Inc. is strictly prohibited.